NLSC CRYSTAL CHEMISTRY PRACTICAL MANUEL

1. Rates od reactions (Chemical kinetics)

Experiment 2:	**FA1** (3.16g of $Na_2S_2O_3$ in one liter of solution) **FA2** (**0.1M** HCl in one liter of solution)
Experiment 3	**FA1 (**7.9g of $Na_2S_2O_3$ in one liter of solution) **FA2 (0.1M** HCl in one liter of solution)
Experiment 4	**BA1 (**3.95g of $Na_2S_2O_3$ in one liter of solution) **BA2 (0.1M** HCl in one liter of solution)
Experiment 5	**FA1 (**7.9g of $Na_2S_2O_3$ in one liter of solution) **FA2 (0.1M** HCl in one liter of solution)
Experiment 6	**FA1 (20 volume** of hydrogen peroxide. **FA2 (**7.9g of $Na_2S_2O_3$ in one liter of solution) **FA3 (0.1M** KI in one liter of solution in 2M H_2SO_4) Starch indicator
Experiment 7	**BA1** is **20** volume hydrogen peroxide **BA2** is 2M Sulphuric acid **BA3** (7.9g of sodium thiosulphate in one liter solution) BA4 is 15% potassium iodide solution Starch indicator
Experiment 8	**BA1 0.2M** dilute hydrochloric acid solution. **BA2** which is distilled water **Solid X** which is sodium hydrogen carbonate.
Experiment 9	**1M** HCl Magnesium powder Magnesium ribbon
Experiment 10	**1M** hydrochloric acid Powdered marble chips Granular marble chips
Experiment 11	**BA1** 7.4g sodium thiosulphate in one liter solution **BA2 0.1M** dilute hydrochloric acid **BA3** which is distilled water.
Reactivity Series of Metals	
Experiment 3.1	**1M** hydrochloric acid Metal A (Pb), B (Ca), C (Mg), D (Cu) and E (Zn) Thermometer
Experiment 3.2	**1M** Hydrochloric acid Metal S (Mg), T (Zn), U (Ca), V (Al) and W (Cu) Thermometer
Experiment 3.3	**1.5M** HCl **Metal** O (Cu), P (Al), Q (Mg), R (Fe) and S (Ca)
Experiment 3.4	**BA1** (25.0g $CuSO_4.5H_2O$ in one liter of solution) **BA2 1M** Hydrochloric acid Metal X (Mg), Y (Cu) and W (Zn) Thermometer
Experiment 3.5	**FA1** (25.0g $CuSO_4.5H_2O$ in one liter of solution)

	Metal powders X and Y Thermometer
Experiment 3.6	Iron fillings Zinc powder **BA1** (25.0g $CuSO_4.5H_2O$ in one liter of solution) Thermometer
Heats of Reactions	
Experiment 4.1	**FA1 1M** sodium hydroxide solution **FA2 1M** An acid X (Nitric acid) **FA3 1M** An acid Y (Ethanoic acid)
Experiment 4.2	**BA1 1M** sodium hydroxide solution **BA2 1M** Ethanoic acid **BA3 1M** Sulphuric acid
Experiment 4.4	**BA1 2M** Sodium hydroxide solution **BA2 2M** Hydrochloric acid
Experiment 4.5	**BA1 2M** Sodium hydroxide solution **BA2 2M** Hydrochloric acid
Experiment 4.6	**FA1 1M** Sodium hydroxide solution **FA2 1M** Hydrochloric acid
Experiment 4.7	**BA1 2M** Sodium hydroxide solution **BA2 2M** Sulphuric acid
Experiment 4.7 Learner's activity (06)	**BA1 1M** sodium hydroxide solution **BA2 1M** ammonium hydroxide solution **BA3 1M** hydrochloric acid
Experiment 4.8	**BA1 1.5M** sodium hydroxide solution **BA2 0.85M** sodium hydroxide solution BA3 **1.5M** hydrochloric acid
Experiment 4.9	**BA1 1.5M** an alkalis solution X of unknown concentration (X is KOH) **BA2 1.5M** an alkalis solution Y of unknown concentration (Y is NH_4OH) **BA3 2M** hydrochloric acid
Experiment 4.10	**BA1 1M** solution of an alkalis X. (NaOH) **BA2 1M** solution of an alkalis Y. (NH_4OH) **BA3 1M** hydrochloric acid
Experiment 4.11	**BA1 1M** sodium hydrogen carbonate. **BA2 1M** hydrochloric acid.
	BA1 1M magnesium hydroxide **BA2 1M** hydrochloric acid.
	BA1 1M sodium sulphate **BA2 1M** copper (II) Nitrate
Experiment 4.12	2.0g of Magnesium metal powder **BA1** 25.0g of copper (II) sulphate solution.

Hard water and soapy detergents	
Experiment 5.1	**Water samples** **O (**0.1M $NaHCO_3$ and 0.1M $CaCl_2$) **P** (0.002M $Ca(OH)_2$ and 0.05M Na_2SO_4) **Q** (0.008M $Ca(OH)_2$ and 0.05M Na_2SO_4) **P** (Rain water) 0.1M Soap solution, prepared by dissolving 45.8g of soap pellets in hot water and then prepared to 1 liter.
Experiment 5.2	**BA1** (0.001M $Ca(OH)_2$ mixed with 0.05M Na_2SO_4) BA2 0.01M soap solution (prepared by dissolving 4.58g of soap pellets in hot water then to 1 liter)
Experiment 5.3	**BA1** Water sample R (0.01M $Ca(OH)_2$ and 0.05M Na_2SO_4) in 1 liter of solution **BA2** (0.1M Soap solution, prepared by dissolving 45.8g of soap pellets in hot water and then prepared to 1 liter).